

Remarks

Reconsideration of this Application is respectfully requested.

Claims 1-40 are pending in the above-captioned application. No claims have been cancelled. Claims 1 and 13 are sought to be amended. New claim 40 is sought to be added. The claim amendments and new claim 40 introduce no new matter and support is replete throughout the specification. These amendments are made without prejudice to renewal of the claims in their original form and are not to be construed as abandonment of the previously claimed subject matter or agreement with any objection or rejection of record.

I. Restriction Requirement.

On January 3, 2006 Applicants responded to a Restriction Requirement, dated December 5, 2006. In the Restriction Requirement the Examiner had alleged that restriction was required. The Examiner identified two inventions drawn to claims 1-12 and claims 13-39, respectively. Applicants provisionally elected to select claims 1-12 for prosecution, but traversed the restriction requirement noting that undue burden would be created through separate prosecution. The present Office Action does not address the Restriction Requirement and Applicant's response, but does provide rejections for all claims. As such, Applicants assume that Applicants' arguments were persuasive, and that the Restriction Requirement has been withdrawn. The present response addresses all original claims.

II. Rejections Under 35 U.S.C. §102(e) as anticipated by U.S. Patent Application 2004/0175844 ("Yang Patent Application") or in the alternative, Under 35 U.S.C. § 103(a) in view of the Yang Patent Application

Claims 1-39 have been rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by the Yang Patent Application. In the alternative, claims 1-39 have also been rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over the Yang Patent Application. Applicants respectfully traverse these rejections.

The Examiner concludes that the Claim 1 of the present invention is anticipated or at least obvious over the Yang Patent Application as "a 'varacter' diode structure is inherent in the p-n junction nanowire design of Yang." Office Action at 3. The Examiner appears to reach this conclusion based on a number of assertions. Specifically, referring to FIG. 22 of the Yang Patent Application, the Examiner asserts that the n-p-n bipolar transistor device of FIG. 22 comprises two p-n junctions that by inherent structure can function as "varactor" diode. Additionally, the Examiner contends that FIGs. 14A-14E of the Yang Patent Application disclose the growth of silicon nanowires on a silicon substrate. Applicants respectfully disagree with the Examiner's conclusions and the assertions on which they are based.

The Yang Patent Application discloses a method for fabricating nanotubes in which nanowires are used as sacrificial templates to create the hollow center of the nanotubes. Yang Patent Application at ¶21. Specifically, the Yang Patent Application discloses a method for fabricating a nanotube comprising (a) forming a nanowire template; (b) depositing a sheath over the nanowire template; and (c) removing the nanowire template. *Id.* FIGs. 14A-14E illustrate the method of

creating nanotubes using sacrificial nanowires. *Id.* at ¶ 97 - 104. One step in that process involves the growth of the sacrificial nanowires. Specifically, FIG. 14A illustrates silicon nanowire arrays that were prepared using chemical vapor deposition. *Id.* at ¶97. According to the Yang Patent Application, "this approach to growing Si nanowires was developed and is utilized in [their] lab for the synthesis of vertical Si/SiGe superlattice nanowire arrays." *Id.*

Applicants respectfully submit that Examiner's supposition that a varactor diode structure is inherent in the p-n junction nanowire design of Yang is flawed and can not serve as the basis to reject claim 1. As a threshold matter, Applicants submit that the mere presence of a p-n junction in a reference can not simply be used to render all subsequent devices using a p-n junction as obvious. If this were the case, few patents would ever issue within the semiconductor device art.

Without explicit disclosure within the Yang Patent Application, one skilled in the art would not reasonably be expected to infer that the nanotubes disclosed within the Yang Patent Application could be used as varactor diodes, especially in light of the fact that nanotechnology using nanostructures generally as electronic devices was at the time of the filing of the present application (and still is) a very nascent industry in which there was not a significantly developed knowledge base. There is no suggestion of the use of nanotubes as varactor diodes within the Yang Patent Application.

Furthermore, because the focus of the Yang Patent Application is on creating nanotubes using sacrificial nanowires as templates, it is unlikely that the Yang Patent Application would directly or indirectly lead one skilled in the art to conclude that a

varacter diode could be developed based on nanowires, as is claimed by the present invention. For at least this reason, claim 1 is allowable over the Yang Patent Application.

Because each dependent claim incorporates all of the elements of the independent claim from which it depends, as well as additional features, the above arguments made with respect to the independent claim 1, apply *a fortiori* to the dependent claims 2-12. For at least this reason, the dependent claims are also patentable over the Yang Patent Application. Reconsideration and allowance of claims 1-12 is respectfully requested.

With respect to claims 13-39, the Examiner makes no new arguments to support rejection other than to note that "[c]laims 13-39 are rejected as they are method claims reciting "forming" steps which ultimately result in the structure defined by product claims 1-2." Office Action at 3-4. As discussed above, the Yang Patent Application teaches a method of making nanotubes, not nanowires in general. Thus, for at least this reason, method claims 13-39 are patentable over the Yang Patent Application.

New Claim 40 has been added. New claim 40 is based on original claim 1, but includes the element of a "semiconductor nanowire having a solid core." As discussed above the Yang Patent Application teaches a nanotube having a hollow core, where the sacrificial nanowire had existed. Thus, the Yang Patent Application does not teach or suggest the element of a semiconductor nanowire having a solid core. Allowance of claim 40 is respectfully requested.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicants believe that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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Amendments to the Drawings

The Examiner objected to the drawings. The Examiner required that new corrected drawings in compliance with 37 C.F.R. 1.121(d) because the original drawings had handwritten numerals and letters. These changes have been made. Formal drawings are included with this response.